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Patent Application

Applicant(s): Francis R. Waldman
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Group: 2665
Examiner: Thien D. Tran

I hereby certify that this paper is being deposited on this date with the U.S. Postal Service as first class mail addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231.

Signature: Teresa M. Haale Date: March 20, 2003

Title: System and Method for Interconnecting ATM Systems Over an Intermediate ATM Network Using Switch Virtual Connections

APPEAL BRIEF

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

Applicant hereby appeals the final rejection dated December 21, 2002 of claims 1, 2 and 9-17 of the above-identified application.

REAL PARTY IN INTEREST

The present application is currently assigned to Avaya Inc. The assignee Avaya Inc. is the real party in interest.

RELATED APPEALS AND INTERFERENCES

There are no known related appeals or interferences.

STATUS OF CLAIMS

Claims 1-17 are pending in the present application. Claims 3-8 are allowed. Each of claims 1, 2 and 9-17 stands finally rejected under 35 U.S.C. §102(e). Claims 1, 2 and 9-17 are appealed.

STATUS OF AMENDMENTS

There have been no amendments filed subsequent to the final rejection.

SUMMARY OF INVENTION

The present invention is directed to techniques for interconnecting different asynchronous transfer mode (ATM) systems. With reference to FIG. 1 of the drawings, and the associated text at page 4, lines 1-16, an ATM switching network in accordance with an illustrative embodiment of the invention includes three local ATM systems 10, 20 and 30 connected to an intermediate switching ATM network 40. Associated with the local ATM systems 10, 20 and 30 are respective border nodes 11, 21 and 31. The local ATM systems 10 and 20 also have respective hosts 15 and 24 associated therewith. The local ATM systems utilize a different addressing scheme than the intermediate switching ATM network 40.

Each of the border nodes (BNs) serves as an interface between a corresponding one of the local systems and the intermediate switching ATM network 40. As indicated in the specification, a given border node recognizes addressing scheme information for both the intermediate switching ATM network and its corresponding local ATM system.

In operation of the FIG. 1 system, a call may be routed, by way of example, from calling party host 15 to called party host 24 over the intermediate switching ATM network 40. The calling party host 15 and the called party host 24 are part of calling party ATM system 10 and called party ATM system 20, respectively. As noted above, border nodes 11 and 21 in this example are associated with the respective calling party ATM system 10 and called party ATM system 20. In accordance with the invention, the call is routed from the calling party host 15 to the called party host 24 over the intermediate switching ATM network 40 via the border nodes 11, 21 based on an intermediate switching ATM network addressing scheme that is recognized by the border nodes 11, 21 and independent of an addressing scheme of the ATM systems 10, 20. See the specification at, for

example, page 4, lines 4-7 and 19-22, page 5, lines 3-7, and page 5, line 22 to page 6, line 9. This aspect of the invention is summarized as follows at page 7, lines 16-22 of the specification:

> In summary, the hosts recognize only the local ATM addresses and are unaware of the intermediate switching ATM network addressing scheme. The BNs serve as an interface between the ATM systems and intermediate switching ATM network. In particular, calling party BNs introduce the addressing scheme recognized by and unique to the intermediate switching ATM network in the called party address information element while routing the call between local ATM systems, whereas called party BNs identify the called party address from the information provided in the called party subaddress information element.

The claimed arrangements provide a number of significant advantages relative to conventional techniques. For example, the invention facilitates the support of switch virtual connection (SVC) based services by eliminating the need to alter the addressing scheme of the intermediate switching ATM network in conjunction with switching from permanent virtual connection (PVC) based services to SVC based services. See the specification at page 1, line 9 to page 2, line 8 and page 9, lines 9-13.

ISSUE PRESENTED FOR REVIEW

Whether claims 1, 2 and 9-17 are anticipated under 35 U.S.C. §102(e) by U.S. Patent No. 5,933,412 (hereinafter "Choudhury").

GROUPING OF CLAIMS

Claims 1, 2 and 9-17 in the above-noted grouping of claims do not stand or fall together. More specifically, claim 1 stands or falls alone, claims 2 stands or falls alone, claims 9-14 stand or fall together, claim 15 stands or falls alone, claim 16 stands or falls alone, and claim 17 stands or falls alone.

ARGUMENT

The Examiner has rejected each of claims 1, 2 and 9-17 as being anticipated under 35 U.S.C. §102(e) by Choudhury. Applicant respectfully traverses this rejection.

Applicant initially notes that §2131 of the Manual of Patent Examining Procedure (MPEP), Eight Edition, August 2001, specifies that a given claim is anticipated "only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference," citing Verdegaal Bros. v. Union Oil Co. of California, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). Moreover, MPEP §2131 indicates that the cited reference must show the "identical invention . . . in as complete detail as is contained in the . . . claim," citing Richardson v. Suzuki Motor Co., 868 F.2d 1226, 1236, 9 USPQ2d 1913, 1920 (Fed. Cir. 1989). For the reasons identified below, Applicant submits that the Examiner has failed to establish anticipation of claims 1, 2 and 9-17 by the Choudhury reference.

With regard to independent claim 1, this claim is directed to a method for interconnecting a calling party asynchronous transfer mode system having a calling party host and a called party asynchronous transfer mode system having a called party host, using an intermediate switching asynchronous transfer mode network and a border node associated with each asynchronous transfer mode system. The method includes the step of routing a call from said calling party host to said called party host over the intermediate switching asynchronous transfer mode network based on an intermediate switching ATM network addressing scheme that is recognized by said border nodes and independent of an addressing scheme of said asynchronous transfer mode systems.

Applicant submits that such an arrangement is not shown in Choudhury. More particularly, there is no teaching or suggestion that the "other domains" shown in FIG. 2 of Choudhury correspond to the claimed intermediate switching asynchronous transfer mode network that utilizes an intermediate switching ATM network addressing scheme that is recognized by said border nodes and independent of an addressing scheme of said asynchronous transfer mode systems, as argued by the Examiner. In contrast, there is apparently only a single addressing scheme being used throughout the different domains of the FIG. 2 system in Choudhury. For example, Choudhury refers to the system in FIG. 2 as a network 100 that is "subdivided" into domains (Choudhury, column 6, lines 4-5), and indicates that a single ATM addressing scheme is used throughout the network 100

(Choudhury, column 5, line 46, to column 6, line 51). In addition, at column 15, lines 38-41, Choudhury states as follows with regard to identifiers of the end hosts:

> It is noted that the MIDs or VCIs should be distributed among the end hosts such that a unique identifier is used for each endpoint. These identifiers may be assigned in the original setup request by the requesting node or they can be assigned by the connection server receiving the setup request.

This passage also suggests that a single ATM addressing scheme is used in the FIG. 2 system of Choudhury. The network 100 is apparently subdivided into domains only for purposes of implementing parallel connection control. There is simply no identifiable "intermediate switching ATM network addressing scheme" in Choudhury that is recognized by border nodes of local ATM systems coupled to an intermediate switching ATM network having an addressing scheme that is independent of an addressing scheme of the local ATM systems.

The Examiner in the final Office Action at pages 5-6, section 4, argues that column 3, lines 55-65 and column 4, lines 10-15 of Choudhury are anticipatory of the limitations of claim 1 regarding the step of "routing a call from said calling party host to said called party host over the intermediate switching asynchronous transfer mode network based on an intermediate switching ATM network addressing scheme that is recognized by said border nodes and independent of an addressing scheme of said asynchronous transfer mode systems." The relevant portions of Choudhury relied upon by the Examiner state as follows, with emphasis supplied:

> Turning to FIG. 1, when an ingress switch, a switch that is connected to an end host that generates the incoming connection setup request message, such as switch SW_1 in network 10, receives a signaling request for the setup of an on-demand connection from an end host 11, it determines the route of the connection using one of the two approaches described above.

In the ITU-T B-ISUP signaling procedure, the optimal table-based routing scheme is employed. Based on the address of a destination party, such as end host 12, indicated in the connection setup signaling request, switch SW_1 determines the next switch in the route by consulting a routing table M_1, which maps each destination address, such as the address of the end host 12, to a next switch identifier. In FIG. 1, the next switch is SW_2 since the virtual path connection is treated as a pre-established logical link. Signaling messages are sent hop-by-hop with this operation being performed at each switch to determine the next switch through which to route the connection.

In the ATM Forum P-NNI signaling procedure, the shortest-path table-based routing scheme is employed. The ingress switch SW_1 computes a route of switches based on its local information about the current network topology and status by performing a generic connection admission control ("GCAC") and shortest-path algorithm. It forms a designated transit list ("DTL") of this set of switches. Signaling messages are sent hop-by-hop along this set of transit switches. In large networks, switches are arranged hierarchically in peer groups. In such networks, the DTL computed at an ingress switch consists of a full detailed path within the ingress switch's own peer group and less detailed paths within other peer groups in the connection. A border node in each subsequent peer group will determine the exact set of transit switches to route the connection through its peer group.

The B-ISUP and P-NNI are thus two different signaling procedures for providing updated routing information to the switches of an ATM network. These signaling procedures cannot be characterized as independent "addressing schemes" within the meaning of claim 1. Instead, the use of these different signaling procedures to convey routing information is consistent with the use of a single ATM addressing scheme throughout the network. The cited portions of Choudhury relied upon by the Examiner thus disclose conventional ATM routing using a single addressing scheme.

In the Advisory Action mailed February 5, 2003, the Examiner further argues anticipation of claim 1 based primarily on the portion of the above-cited passage from Choudhury which states that "a border node in each subsequent peer group will determine the exact set of transit switches to

route the connection through its peer group." Applicant again asserts that these teachings from Choudhury simply relate to a particular signaling procedure for conveying routing information. In other words, the "border node" referred to in Choudhury is not coupled between a particular local ATM system and an intermediate switching ATM network, where the particular local ATM system and the intermediate switching ATM network use independent addressing schemes as claimed. Instead, a Choudhury "border node" is simply a node associated with a given peer group at a particular level in a hierarchy of switches. The different switches at the various levels of the peer group hierarchy apparently all utilize the same ATM addressing scheme. Applicant thus submits that the term "border node" as used in Choudhury is being taken out of context and improperly applied to the claimed arrangements. It appears that a key word search on the term "border node" led to the citation of the Choudhury reference, but as indicated above significant limitations of claim 1 are not present in any way within this reference.

It is therefore believed that Choudhury fails to disclose "each and every element" of claim 1 in "as complete detail as is contained in the . . . claim," as would be required for a proper anticipation rejection in accordance with MPEP §2131 and 35 U.S.C. §102. Moreover, the Choudhury system does not provide the above-noted advantages of the claimed invention in terms of facilitating the support of SVC based services by eliminating the need to alter the addressing scheme of the intermediate switching ATM network in conjunction with switching from PVC based services to SVC based services.

Dependent claim 2 is believed to be allowable for at least the reasons identified above with regard to claim 1.

Moreover, dependent claim 2 is believed to define additional patentable subject matter. For example, there is no teaching or suggestion in Choudhury regarding the claimed substituting, at the border node of the calling party asynchronous transfer mode system, in a called party address information element, an intermediate switching asynchronous transfer mode network address of the border node of the called party asynchronous transfer mode system for the asynchronous transfer mode system address of the called party host. The Examiner argues that such substitution is disclosed in Choudhury by translating of VPIs and VCIs from switch to switch. However, the Choudhury translation will apparently also be done in establishing a connection from one switch to

another within a single domain. The mere presence of such translation does not anticipate the claimed substitution, which requires an intermediate ATM network addressing scheme which is independent of that used in the calling party and called party systems.

With regard to independent claim 9, this claim specifies that calling party and called party asynchronous transfer mode systems have an addressing scheme independent from the addressing scheme of an intermediate switching asynchronous transfer mode network, and that border nodes interface between the addressing scheme of the asynchronous transfer mode systems and the intermediate switching asynchronous transfer mode network addressing scheme. As discussed above in conjunction with claims 1 and 2, such an arrangement is not taught or suggested by the Choudhury reference. Instead, Choudhury apparently makes no distinction between particular addressing schemes used in the various domains of network 100, with the result that network 100 operates using a single addressing scheme.

The Examiner in the final Office Action at page 6, second paragraph, states that the limitation "addressing scheme used in various domains of network" is not in claim 9. The Examiner has misconstrued the argument presented by Applicant. Applicant is not arguing that this particular language is a limitation of claim 9. What Applicant is arguing is that Choudhury does not teach or suggest the use of independent addressing schemes in two or more of the various domains of network 100, as would be required by claim 9. As a result, Choudhury apparently operates with a single addressing scheme throughout the network 100, and therefore fails to meet the limitations of claim 9 regarding calling party and called party asynchronous transfer mode systems that have an addressing scheme independent from the addressing scheme of an intermediate switching asynchronous transfer mode network.

Dependent claims 11-14 are believed allowable for at least the reasons identified above with regard to independent claim 9.

With regard to independent claim 15, this claim calls for a particular type of address substitution which is not taught or suggested in Choudhury, namely, "substituting at a calling party border node an intermediate switching asynchronous transfer mode network address of a called party border node for an asynchronous transfer mode system address of a called party host." As noted above, it is believed that VPI/VCI translation within a given ATM network does not anticipate

substituting, at a calling party border node, an intermediate switching asynchronous transfer mode network address of a called party border node for an asynchronous transfer mode system address of a called party host.

The Examiner in the final Office Action at page 6, third paragraph, argues that the particular address substitution limitations of claim 15 are taught in the above-cited passage from column 3, lines 55-65. Applicant respectfully disagrees. As indicated previously, the passage at issue refers the conventional B-ISUP signaling procedure for providing updated routing information to the switches of an ATM network. In conjunction with this procedure, a given switch uses a routing table to determine the next switch which is to receive the connection.

However, this routing table based address lookup cannot reasonably be construed as teaching the specific address substitution limitations of claim 15. As noted above, claim 15 calls for "substituting at a calling party border node an intermediate switching asynchronous transfer mode network address of a called party border node for an asynchronous transfer mode system address of a called party host." Simply looking up in a routing table at a given switch the address of the next switch in the connection does not teach or suggest the particular substitution step that is claimed.

With regard to independent claim 16, this claim calls for a type of address substitution which is not taught or suggested in Choudhury, namely, "substituting at a called party border node an asynchronous transfer mode system address of the called party host for an intermediate switching asynchronous transfer mode network address of the called party border node." As noted above, it is believed that VPI/VCI translation within a given ATM network does not anticipate substituting, at a called party border node, an asynchronous transfer mode system address of the called party host for an intermediate switching asynchronous transfer mode network address of the called party border node.

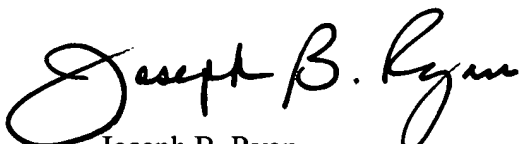
The Examiner in the final Office Action at page 6, third paragraph, argues that the particular address substitution limitations of claim 16 are taught in the above-cited passage from column 3, lines 55-65. Applicant respectfully disagrees. As indicated previously, the passage at issue refers the conventional B-ISUP signaling procedure for providing updated routing information to the switches of an ATM network. In conjunction with this procedure, a given switch uses a routing table to determine the next switch which is to receive the connection.

However, this routing table based address lookup cannot reasonably be construed as teaching the specific address substitution limitations of claim 16. As noted above, claim 16 calls for "substituting at a called party border node an asynchronous transfer mode system address of the called party host for an intermediate switching asynchronous transfer mode network address of the called party border node." Again, simply looking up in a routing table at a given switch the address of the next switch in the connection does not teach or suggest the particular substitution step that is claimed.

With regard to independent claim 17, this claim also specifies calling party and called party asynchronous transfer mode systems which have an addressing scheme which is independent of an addressing scheme of an intermediate switching ATM network. The arguments above regarding claim 1 on this point are therefore realleged and incorporated herein by reference. Moreover, this claim includes a "substituting" step at the calling party border node which is not taught or suggested by Choudhury. Other steps of the claim 17 method are also not taught or suggested by Choudhury, such as the "generating" step at the called party border node. The deficiencies of portions of the Choudhury reference cited by the Examiner in support of anticipation of claim 17, namely FIG. 2 and column 3, lines 55-65, have been described in detail elsewhere herein. With regard to the reference to FIG. 6 and column 6, lines 5-55, Applicant has reviewed these portions of Choudhury and submits that these portions similarly fail to teach or suggest the independent addressing scheme aspects or at least the above-noted "substituting" and "generating" steps of claim 17.

In view of the foregoing, Applicant believes that claims 1, 2 and 9-17 are in condition for allowance, and respectfully requests the withdrawal of the §102(e) rejection.

Respectfully submitted,



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APPENDIX

1. A method for interconnecting a calling party asynchronous transfer mode system having a calling party host and a called party asynchronous transfer mode system having a called party host using an intermediate switching asynchronous transfer mode network and a border node associated with each asynchronous transfer mode system comprising:

routing a call from said calling party host to said called party host over the intermediate switching asynchronous transfer mode network based on an intermediate switching ATM network addressing scheme that is recognized by said border nodes and independent of an addressing scheme of said asynchronous transfer mode systems.

2. A method in accordance with claim 1, wherein said routing step comprises:

substituting at the border node of the calling party asynchronous transfer mode system in a called party address information element an intermediate switching asynchronous transfer mode network address of the border node of the called party asynchronous transfer mode system for the asynchronous transfer mode system address of the called party host; and

routing the call over the intermediate switching asynchronous transfer mode network from the border node of the calling party asynchronous transfer mode system to the border node of the called party asynchronous transfer mode system based on the intermediate switching asynchronous transfer mode network address in the called party address information element.

3. A method for interconnecting a calling party asynchronous transfer mode system to a called party asynchronous transfer mode system by way of a calling party border node, an

intermediate switching asynchronous transfer mode network having an intermediate asynchronous transfer mode network addressing scheme, and a called party border node, the calling party asynchronous transfer mode system having a calling party host connected to the calling party border node by at least one calling party non-border node, the called party asynchronous transfer mode system having a called party host connected to the called party border node by at least one called party non-border node, the calling and called party hosts having an asynchronous transfer mode system addressing scheme independent of the intermediate switching asynchronous transfer mode network addressing scheme, comprising:

generating at the calling party host a SETUP message specifying the asynchronous transfer mode system address of the called party host in a called party address information element;

routing the call to the at least one calling party non-border node based on the called party address information element;

generating at the at least one calling party non-border node a SETUP message specifying in a called party subaddress information element the asynchronous transfer mode system address of the called party host from the called party address information element;

routing the call to the calling party border node;

substituting at the calling party border node in the called party address information element the intermediate switching asynchronous transfer mode network address of the called party border node for the asynchronous transfer mode system address of the called party host;

transmitting the call over the intermediate switching asynchronous transfer mode network to the called party border node based on the intermediate switching asynchronous transfer

mode network address of the called party border node in the called party address information element;

generating at the called party border node a SETUP message specifying in the called party address information element the asynchronous transfer mode system address of the called party host from the called party subaddress information element;

routing to the at least one called party non-border node the call based on the asynchronous transfer mode system address of the called party host in the called party address information element;

generating at the at least one called party non-border node a SETUP message specifying in the called party address information element the asynchronous transfer mode system address of the called party host, without identifying the called party subaddress information element; and

routing the call to the called party host based on the asynchronous transfer mode system address of the called party host in the called party address information element.

4. A method in accordance with claim 3, wherein the called party subaddress is encrypted.

5. A method in accordance with claim 3, wherein said step of generating at the calling party host the SETUP message further comprises identifying the asynchronous transfer mode system address of the called party host using one of provisioning, local area network emulation, multi-protocol over asynchronous transfer mode, and proprietary techniques.

6. A method for interconnecting a calling party asynchronous transfer mode system to a called party asynchronous transfer mode system by way of a calling party border node, an intermediate switching asynchronous transfer mode network having an intermediate asynchronous transfer mode network addressing scheme, and a called party border node, the calling party asynchronous transfer mode system having a calling party host directly connected to the calling party border node, the called party asynchronous transfer mode system having a called party host directly connected to the called party border node, the calling and called party hosts having an asynchronous transfer mode system addressing scheme independent of the intermediate switching asynchronous transfer mode network addressing scheme, comprising:

generating at the calling party host a SETUP message specifying the asynchronous transfer mode system address of the called party host in a called party address information element;

generating at the calling party border node a SETUP message specifying in a called party subaddress information element the asynchronous transfer mode system address of the called party host in the called party address information element;

substituting at the calling party border node in the called party address information element the intermediate switching asynchronous transfer mode network address of the called party border node for the asynchronous transfer mode system address of the called party host;

transmitting the call over the intermediate switching asynchronous transfer mode network to the called party border node based on the intermediate switching asynchronous transfer mode network address of the called party border node in the called party address information element;

generating at the called party border node a SETUP message specifying in the called party address information element the asynchronous transfer mode system address of the called party host from the called party subaddress information element;

routing the call to the called party border node based on the asynchronous transfer mode system address of the called party host in the called party address information element;

generating at the called party border node a SETUP message specifying in the called party address information element the asynchronous transfer mode system address of the called party host, without identifying the called party subaddress information element; and

routing the call to the called party host based on the asynchronous transfer mode system address of the called party host in the called party address information element.

7. A method in accordance with claim 6, wherein the called party subaddress is encrypted.

8. A method in accordance with claim 6, wherein said step of generating at the calling party host the SETUP message further comprises identifying the asynchronous transfer mode system address of the called party host using one of provisioning, local area network emulation, multi-protocol over asynchronous transfer mode, and proprietary techniques.

9. A system for interconnecting asynchronous transfer mode systems comprising:

an intermediate switching asynchronous transfer mode network having an asynchronous transfer mode addressing scheme;

a calling party border node connected to said intermediate switching asynchronous transfer mode network;

a called party border node connected to said intermediate switching asynchronous transfer mode network;

a calling party asynchronous transfer mode system connected to said calling party border node; and

a called party asynchronous transfer mode system connected to said called party border node;

said asynchronous transfer mode systems having an addressing scheme independent from the addressing scheme of said intermediate switching asynchronous transfer mode network, and said border nodes interfacing between the addressing scheme of said asynchronous transfer mode systems and the intermediate switching asynchronous transfer mode network addressing scheme.

10. A system in accordance with claim 9, wherein said border nodes are asynchronous transfer mode switches.

11. (Amended) A system in accordance with claim 9, wherein said calling party asynchronous transfer mode system comprises a calling party host directly connected to said calling party border node.

12. A system in accordance with claim 9, wherein said calling party asynchronous transfer mode system comprises:

a calling party host; and

at least one calling party non-border node connected between said calling party host and said calling party border node.

13. A system in accordance with claim 9, wherein said called party asynchronous transfer mode system comprises a called party host directly connected to said called party border node.

14. A system in accordance with claim 9, wherein said called party asynchronous transfer mode system comprises:

a called party host; and

at least one called party non-border node connected between said called party host and said called party border node.

15. An asynchronous transfer mode switching method comprising:

substituting at a calling party border node an intermediate switching asynchronous transfer mode network address of a called party border node for an asynchronous transfer mode system address of a called party host.

16. An asynchronous transfer mode switching method comprising:

substituting at a called party border node an asynchronous transfer mode system address of the called party host for an intermediate switching asynchronous transfer mode network address of the called party border node.

17. A method for interconnecting a calling party asynchronous transfer mode system to a called party asynchronous transfer mode system by way of a calling party border node, an intermediate switching asynchronous transfer mode network having an intermediate asynchronous transfer mode network addressing scheme, and a called party border node, the calling party asynchronous transfer mode system having a calling party host connected to the calling party border node, the called party asynchronous transfer mode system having a called party host connected to the called party border node, the calling and called party hosts having an asynchronous transfer mode system addressing scheme independent of the intermediate switching asynchronous transfer mode network addressing scheme, comprising:

generating at the calling party host a message specifying the asynchronous transfer mode system address of the called party host in a called party address information element;

routing the call to the calling party border node;

substituting at the calling party border node in the called party address information element the intermediate switching asynchronous transfer mode network address of the called party border node for the asynchronous transfer mode system address of the called party host;

transmitting the call over the intermediate switching asynchronous transfer mode network to the called party border node based on the intermediate switching asynchronous transfer mode network address of the called party border node in the called party address information element;

generating at the called party border node a message specifying in the called party address information element the asynchronous transfer mode system address of the called party host; and

routing the call to the called party host based on the asynchronous transfer mode system address of the called party host in the called party address information element.